

FRANK, Otto

Prolapse of the rectum in children. Cesk.pediat.16 no.3:238-241
Mr '61.

1. Klinika pediatrické chirurgie pediatrické fakulty KU v Praze,
prednosta doc. MUDr. V. Kafka.
(RECTUM dis)

FRANK, O.

Aganglionic dysfunction of the intestines in newborns and
infants. Rozhl. chir. 43 no.11.731-736 N '64.

1. Klinika pro detskou chirurgii fakulty detskaho lekarstvi
Karlov University v Praze, (prednosta prof. dr. V. Karka,
DrSc.).

FRANK, Otto, dr.

Disability evaluation in paralysis of the extremities. Lijecn.
vjesn. 86 no.2:187-199 F'64

1. Iz Drugostepene invalidske komisije Republickog zavoda za
socijalno osiguranje u Zagrebu.

S-

FRANK, Otto, dr.

Role of the general practitioner in disability insurance. Lijecn.
vjesn. 86 no. 5:571-580 My '64

1. Iz Drugostepene invalidske komisije Republickog zavoda za
socijalno osiguranje u Zagrebu.

Frank, S.

The common bullhead (Ameiurus nebulosus les. 1819) in waters of our
country. P. 35
Prague. Narodni Museum. CASOPIS; ODDIL PRIRODOV FDNY. Praha.
Vol. 125, no. 1, 1956

Source: EEAL - LC Vol. 5. No. 10 Oct. 1956

FRANK, St.

Nannobrycon eques (Steindachner). Wszechswiat no. 5:123-124
My'61.

FRANK, S.

Trichogaster trichopterus var. sumatranus Ladiges 1933. Wszechswiat
no. 9:239 S '62.

FRANK, S.

Jordanella floridæ (Goode and Bean 1879). Wszechswiat no. 7/8:
204 Jl-Ag '62.

FRANK, S.

Pterophyllum eimekei Ahl 1928. Wszechswiat no.7/8:204 Jl-Ag
'62.

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CIA-RDP86-00513R000413610002-4

FRANK, S.

~~Gymnophorus~~ *Gymnophorus ternetzi* (Boulenger 1895). Wszechswiat no.6:
163 Ja '62.

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CIA-RDP86-00513R000413610002-4"

FRANK, S.

Roeboides microlepis (Reinhardt 1849). Wszechswiat no. 6:163-
164 Je '62.

YARUSTOVSKIY, A.A.; SVETLOV, N.F.; LIKIN, V.V., redaktor; BALAKIREV, V.F.,
redaktor; ~~FRANK, S.I.~~, vedushchiy redaktor; BEGICHEVA, M.N.,
tekhnicheskiy redaktor.

[Operation of mechanical and electrical sluice gate equipment]
Eksploatatsiya mekhanicheskogo i elektricheskogo oborudovaniia
shliuzov. Moskva, Izd-vo Ministerstva rechnogo flota SSSR, 1952.
210 p. [Microfilm]
(Sluice gates)

(MLRA 7:11)

FRANK, T.

FRANK, T. 1st National Economic Conference of the Textile Industry. p. 28.

Vol. 11, No. 12, June 1956.

MUSZAKI ELET

TECHNOLOGY

Budapest, Hungary

So: East European Accession, Vol. 6, No. 2, Feb. 1957

FRANK, Tibor

Mechanization of the cleaning of textile factories as a
means of industrial organization. Magy textil 15 no.8:
388 Ag '63.

FRANK, Tibor

Relationship of industrial management with work psychology
and work physiology in the field of textile industry. Magy
textil 15 no.12:565-571 D '63.

FRANK T.

Frank T.

Frank T. Eng. "Pumps and Injectors Used in Steam Power Stations." (Pompy i strumienice stosowane w elektrowniach cieplnych). Energetyka. No. 1-2, 1950, pp. 13-21, 9 figs. 1 tab.

The influence of temperature on the operation of the pumps, cavitation and the origin of that phenomenon in hot water pumps. Descriptions of the arrangement of pumps in steam-power plants, drive and design of circulating water pumps, characteristics of the work and design of condensate-removal pumps. Reciprocating air pumps and their design, steam and water injectors. Arrangement of pumps, boiler feed water tanks and deaerators in general use. Selecting the size of feed water pumps on the basis of characteristics of their curves. Indications for designing feed water pump installations in boiler houses.

SO: Polish Technical Abstracts No. 2, 1951

Frank, T.

61131122

4872. Layout of the main building of a power station with 50 MW turbogenerators. Z. Moczo-
kowski, prof. T. Frank, Przedsiębied elektrotech., 30,
178-82 (May 21, 1954) to Poltek.

Relatively small floor area and size of the main building of steam power station are required by units comprising two 60 MVA 10 kV turbogenerators and 110 atm. 510°C 230 tons/hour boilers. Details of steam system, coal pulverizing plant, main electrical circuit and two alternative layouts of equipment and of the reinforced concrete buildings are given.

J. LUKASZEWSKI

FRANK, T.

Completion of the largest thermoelectric power plant in Denmark, p. 49. (ENERGETYKA, Stalinogrod, Vol. 9, no. 1, Jan./Feb. 1955.)

SO: Monthly List of East European Accessions, (EEAL), LC, Vol. 4, No. 1, Jan. 1955, Uncl.

FRANK, T.

The technical book as an aid to worker and engineer.

p. 161
Vol. 9, no. 3, May/June 1955
ENERGENTYKA
Stalinogrod

SO: Monthly List of East European Acquisitions (EEAL) LC, VOL. 5, no. 2
Feb. 1956

FRANK, T.

A discussion of Soviet electric power engineers on electric systems of hydroelectric power plants. p. 229.

ENERGETYKA, Vol. 9, No. 5 Sept./Oct. 1955

(Ministerstwo Energetyki) Stalinogrod.

SOURCE: EAST EUROPEAN ACCESSIONS LIST Vol. 5, No. 1 Jan. 1956

FRANK, T.

Increasing the coefficient of power of equipment used in electric-power plants.

p.39.

ENERGETYKA (Ministerstwo Energetyki) Stalinogrod

Vol. 10, no. 1, Jan./Feb. 1956

So. East European Accessions List

Vol. 5, No. 9

September 1956

FRANK, T.

FRANK, T. Selection of equipment for direct current installations in
electric-power plants. p.292 Vol. 32 no. 7 July 1956
Warszawa Poland

SOURCE: East European Accessions List (EEAL) Vol. 6 No. 4 April 1957

FRANK, T.

FRANK, T. Organizational problems in light industry. p. 35.

Vol. 10, no. 6, June 1956

TOBBTERMELES

Budapest, Hungary

So: East European Accession, Vol. 6, No. 5, May 1957

FRANK, Tibor; SZASZ, Marton; MARK, Ferenc; BOSNYAK, Tamas; LUGOSI, Karoly;
FEKETE, Istvan; TOMPOS, Karoly; KABDEBO, Kornel; JAVOR, Bela; SCHEFTSIK, Jeno;
VOGL, Ferenc; REITER, Gyorgy

Conference on the current tasks of the light industry workers. 'Tunka
szemle 5 no.3:5-7 Mr '61.

1. Textilipari Muszaki Tudomanyos Egyesulet Ipargazdasagi Szakosztalya
titkara (for Frank). 2. Kispesti Textilgyar munkauggyi osztaly vezetoje
(for Mark). 3. Konnyuipari Miniszterium Munkauggyi es Oktatasi Onallo Osz-
talya vezetoje (for Szasz). 4. Ujpesti Gyapjuszovogyar munkauggyi osztalya
vezetoje (for Bosnyak). 5. Kender Juta es Textil Ipar munkauggyi osztaly
vezetoje (for Lugosi). 6. Kobanyai Textilgyar munkauggyi osztalya vezetoje
(for Fekete). 7. Konnyuipari Miniszterium Pamutipari Igazgatosaga mun-
kauggyi osztaly vezetoje (for Tompos). 8. Magyar Pamutipar munkauggyi osz-
talya vezetoje (for Kabdebo). 9. Majus 1 Ruhagyar munkauggyi osztalya
vezetoje (for Javor). 10. Konnyuipari Miniszterium Len-Kenderipari Igaz-
gatosaga munkauggyi osztalya vezetoje (for Scheftsi). 11. Ruhaiipari
Tervezo Vallalat (for Vogl). 12. Goldberger Textilmuvek munkauggyi foosz-
taly vezetoje (for Reiter).

FRANK, Tibor

Is plant management an organic part of the activity of
Hungary's textile industry enterprises? A polemic article.
Magy textil 14 no.2:84-85 F '62.

FRANK, Tibor; KOTWICKI, T. [translator]

Present state and tasks for the future in the field of
organization of enterprises in the Hungarian textile
industry. Przegl wlokiem 16 no.7/8:431-433 J1-Ag '62.

FRANK, Tibor

Organization and procedure of the technical divisions of the technical industry enterprises. Magy textil 14 no.11: 515-517 N '62.

1. Hazai Pamutszovogyar.

FRANK, Tibor

Improvement of the transportation work at the Hungarian Cotton
Weaving Factory. Kozleked kozl. 18 no.48:865-867 2 D '62.

FRANK, Tibor

Report on the Moscow conference on the textile industry economics.
Magy textil 15 no.4:188-189 Ap '63.

FRANK, Tibor

Training of textile industry engineers-economists in the
Soviet Union. Magy textil 15 no.5/6:264 My-Je '63.

FRANK, Tibor

Aptitude tests carried out in the Hungarian Cotton Mill. Magy
textil 15 no.7:317-318 J1 '63.

FRANK, Tibor

Organizational experience with the manager of the textile industry enterprises. Musz elet 18 no.9:6 25 Ap '63.

FRANK, Tibor

Possibilities for the development of industrial management
within the framework of the Federation of Technical and Scientific
Associations. Muzs elet 18 no.21:2 10 0 '63.

FRANK, Tibor

Problems relating to the selection and employment of textile industry workers. Munka szemle 8 no.4:7-9 Ap '64.

FRANK, Tibor

Formation of an up-to-date organization at industrial enterprises.
Munka szemle 8 no.11:20-23 N '64.

FRANK, Tibor

Conditions for the formation of an adequate "operational atmosphere." Magy textil 16 no. 6:280-283 Je '64.

FRANK, Tibor

Is there any manpower shortage in the light industry? Musz
elat 19 no.19:4 10 S '64

FROM: M. Tibor

Is there any shortage of manpower in the light industry?
Musz elet 19 no.21:2 80 '64.

FRANK, Tibor

Organizational tasks of management. Elelm ipar 18 no.10;
321-328 0 '64.

FRANK, Tibor

New features of the work of the Federation of Technical
and Scientific Associations. Musz elet 20 no.1&2 14 Ja '65.

CISAR, Ludvik, inz.; FRANK, Vaclav, inz.

Causes and analysis of the collapse of some constructions.
Poz stavby 11 no.11: 603-606 '63.

1. Technicky a zkusebni ustav stavebni, Praha.

FRANK, W.

Structural balances in power economy. p. 570

ENERGLIA ES ATOMTECHNIKA. (Energiagazdalkodasi Tudomanyos Egyesulet)
Budapest Hungary

Vol. 11, no. 9/10, Sept./Oct. 1958

Monthly list of East European Accessions (EEAI) LC., VOL. 8, no. 7, July 1959

Uncl.

YANOVSKIY, M.I.; GAZIYEV, G.A.; NIKIFOROV, V.P.; MAKARENKO, V.G.; ZIMIN,
R.A.; MARININ, P.I.; FRANK, Yu.A.

Gas chromatograph with automatic pickup of samples from a flow.
Zav. lab. 31 no. 1281526-1528 '65 (MIRA 19:1)

1. Institut khimicheskoy fiziki AN SSSR.

✓ The Construction of Electrodynamic Sensors of Rod-Shaped Materials. L. Kral: (Sbornik Detektorov, 1960, 261-284).
[In Czech] The construction of varistors is discussed with special reference to a judgment of recent Czech.

DOMAC-TESAR, B.; FRANK, Z.

Malformations formed by local application of hypothermia
in the second half of pregnancy in the white rats. Bul sc
Youg 7 no.1/2:5-6 F-Ap '62.

1. Zavod za histologiju i embriologiju Medicinskog fakulteta,
Zagreb,

X

Internal Medicine

CZECHOSLOVAKIA

FRANK, Zdenek; STVERAL, Jiri; DVORAK, Josef; Institute of Aero-nautical Medicine (Ustav Leteckeho Zdravotnictvi), Prague.

"Radio Waves Another Scourge of Civilization."

Prague, Radar, Vol 1, No 3, Nov 66, pp 56 - 58

Abstract: Factors influencing the medium in which people are living are discussed. Radio waves are defined as waves with frequencies between 100 kilocycles and 3,000,000 kilocycles, that is waves 1 cm to 3,000 meters long. Although these waves do not affect the senses of the body, they do have an influence on it. Thermal and non-thermal effects of the radio waves on the human organism are described. Clinical aspects of these effects are evaluated. Some of these effects are described in detail. Protection against the influence of electromagnetic fields is discussed; some peculiar effects of these fields on human beings are described. Biological effects of radio waves are discussed. 1 Table, no references.

1/1

Problem of the development of automation technology in the chemical industry. Automatizace 7 no.12:318-319 D '64.

1. Institute of Chemical Industry, Automation, Satelice.

FRANK-KAMENETSKI, A. D.

Origin of chemical elements. Biol i khim 5 no. 2:1-12 '63.

L 17129-63 EWT(d)/EPF(n)-2/FCC(w)/BDS AFFTC/ASD/ESD-3/APCC/IJP(C)/SSD
P0-4
ACCESSION NR: AP3004963 S/0208/63/003/004/0766/0769

AUTHOR: Frank-Kamenetskiy, A. D. (Moscow)

TITLE: Solution of a kinetic equation by the Monte Carlo method

SOURCE: Zhurnal vychisl. matematiki i matematich. fiziki, v. 3, no. 4, 1963,
766-769

TOPIC TAGS: Monte Carlo, kinetic equation, approximate solution

ABSTRACT: Use of the Monte Carlo method allows the acceleration of computation on standard high-speed machines, obtaining the solution of a kinetic equation with essentially greater accuracy than by the use of other known methods. The author considers such a solution of a kinetic equation in an example of the problem of finding the distribution of the flow of mono-energetic neutrons in a multi-zone heterogeneous cylindrical nucleus with arbitrary distribution of isotropic sources. For finding the mean flows in the zones Φ_k , the random motions N of the neutrons are tracked from the moment of "birth" to capture. For each neutron, its mileage in the given zone λ_{ky} is registered. Obviously, for large values of N

Card 1/2

L 17129-63

ACCESSION NR: AP3004963

$$\bar{\Phi}_k = \frac{c}{V_k N} \sum_{v=1}^N \lambda_{kv} \quad (1)$$

where 'c' is an arbitrary constant. The initial coordinates of the neutrons are chosen in a random fashion with respect to the given distribution of the sources. "I express my deep gratitude to I. M. Sobol' for his valuable comments." Orig. art. has: 6 formulas, 1 graph, and 1 table.

ASSOCIATION: none

SUBMITTED: 27Aug62

DATE ACQ: 30Aug63

ENCL: 00

SUB CODE: MM

NO REF ISOV: 003

OTHER: 001

Card 2/2

VALENTA, Oldrich, inz. dr. CSc.; WEINER, Evzen, inz. dr. CSc. [deceased]

Effect of long-lasting vibration on the strength and bond of concrete.
Stav cas 12 no.2:85-101 '64.

ACCESSION NR: AP4015558

S/0089/64/016/002/0119/0122

AUTHOR: Frank-Kamenetskiy, A. D.

TITLE: Application of the Monte-Carlo method to the multigroup reactor computation

SOURCE: Atomnaya energiya, v. 16, no. 2, 1964, 119-122

TOPIC TAGS: Monte-Carlo method, multi group reactor computation, fission cross-section neutron capture, neutron scattering

ABSTRACT: The author discusses the application of the Monte-Carlo method for determination of the multiplication coefficient and the energy and space distribution of neutron fluxes in the multi-group transport approximation. The neutron scattering is assumed to be isotropic in the laboratory system. The probabilities of transitions between groups depend on both the elastic and inelastic neutron scattering. The computation of trajectories and fluxes in the group is similar to that given in the author's previous work (Zh. vy*chisl. matem. i matem. fiziki v. 3, 766 (1963)), as applied to two-

Card 1/2

ACCESSION NR: AP4015558

dimensional cylindrical geometry. Several generations of neutrons (original, secondary, etc.) are considered in succession. The method is justified when the ratio of the size of the active zone and the average migration path is close to unity. Thus, the Monte-Carlo method supplements the other computational method; its error is minimal when that of the diffusion approximation is maximal. Orig. art. has: 2 figures and 1 table.

ASSOCIATION: none

SUBMITTED: 17Jul63

DATE ACQ: 12Mar64

ENCL: 00

SUB CODE: NS

NO REF SOV: 006

OTHER: 005

Card2/2

SOV/124-58-1-1263

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 1, p 156 (USSR)

AUTHOR: Frank-Kamenetskiy, G. Kh.

TITLE: Strain Calculation for Ring-shaped Parts (Raschet deformatsiy
kol'tsevykh detaley)

PERIODICAL: V sb.: Gidroturbostroyeniye, Nr 4. Moscow-Leningrad, Mashgiz,
1957, pp 195-210

ABSTRACT: Bibliographic entry

Card 1/1

FRANK-KAMENETSKIY, L. Z.

"Partial Denervation of the Stomach in Ulcerous Diseases," Khirurgiya, No.5,
1948.

Surgical Clinic, 2nd Moscow Med. Inst. im. Stalin

USSR/Medicine/Neurology FRANZIA LIBRARY REFERENCE

FD-2439

Card 1/1 Pub. 17-3/23

Author : Frank- Kamenetskiy L. Z. (deceased) and Khodzhayev, Z. P.

Title : The vagus nerves as conductors of motor impulses to stomach and duodenum

Periodical : Eyul. eksp. biol. i med., 7, 10-12, July 1955

Abstract : Following earlier experiments with resection of both vagus nerves below the diaphragm, author undertook chronic experiments on dogs cutting either the left (anterior) or the right (posterior) trunk. Both nerves were cut on the controls. The left resection produced changes typical of bilateral subdiaphragmatic vagotomy, the right resection affected only the stomach fundus. There was a comparatively quick restoration of motor functions of the stomach and duodenum after resection of either nerve trunk. 1 reference, 1 USSR, 1 since 1940, photographs.

Institution : Stalinabad Medical Institute

Submitted : 20 August 1954

BRINDLEY, G.W.; ZVYAGIN, B.B.[translator]; FRANK-KAMENETSKAYA, T.A.,
[translator] redaktor; TSUKERMAN, A.M., redaktor; GRIBOVA, M.P.
tekhnicheskiy redaktor.

[X-ray identification and crystal structures of clay minerals;
collection of articles. Translated from the English] Rentgenovskie
metody opredeleniya i kristallicheskoe stroenie mineralov glin;
sbornik statei. Perevod s angliiskogo B.B.Zviagina i T.A.Frank-
Kamenetskoi. Pod red. i s predlisl. V.A.Frank-Kamenetskogo. Moskva,
izd-vo inostrannoi lit-ry, 1955. 402 p. (MLRA 8:11)
(Clay) (X-rays)

-FRANK-KAMENETSKAYA, T.A.

GRIM, Ralph E.; ZVYAGIN, B.B. [translator]; MIKHEYEV, I.V. [translator];
MIKHEYEV, V.I. [translator]; RAZBEGAYEVA, G.I. [translator];
FRANK-KAMENETSKAYA, T.A. [translator]; FRANK-KAMENETSKIY, V.A.,
redaktor; YAKOVENKO, M.Ye., redaktor; DUMBRE, I.Ya., tekhnicheskiy
redaktor

[Clay mineralogy. Translated from the English] Mineralogia glin.
Perevod angliiskogo B.B.Zviagina i dr. Pod red. i s predisl. V.A.
Frank-Kamenetskogo. Moskva, Izd-vo inostrannoi lit-ry, 1956.
454 p. (MLRA 9:10)

(Clay)

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1933-1957

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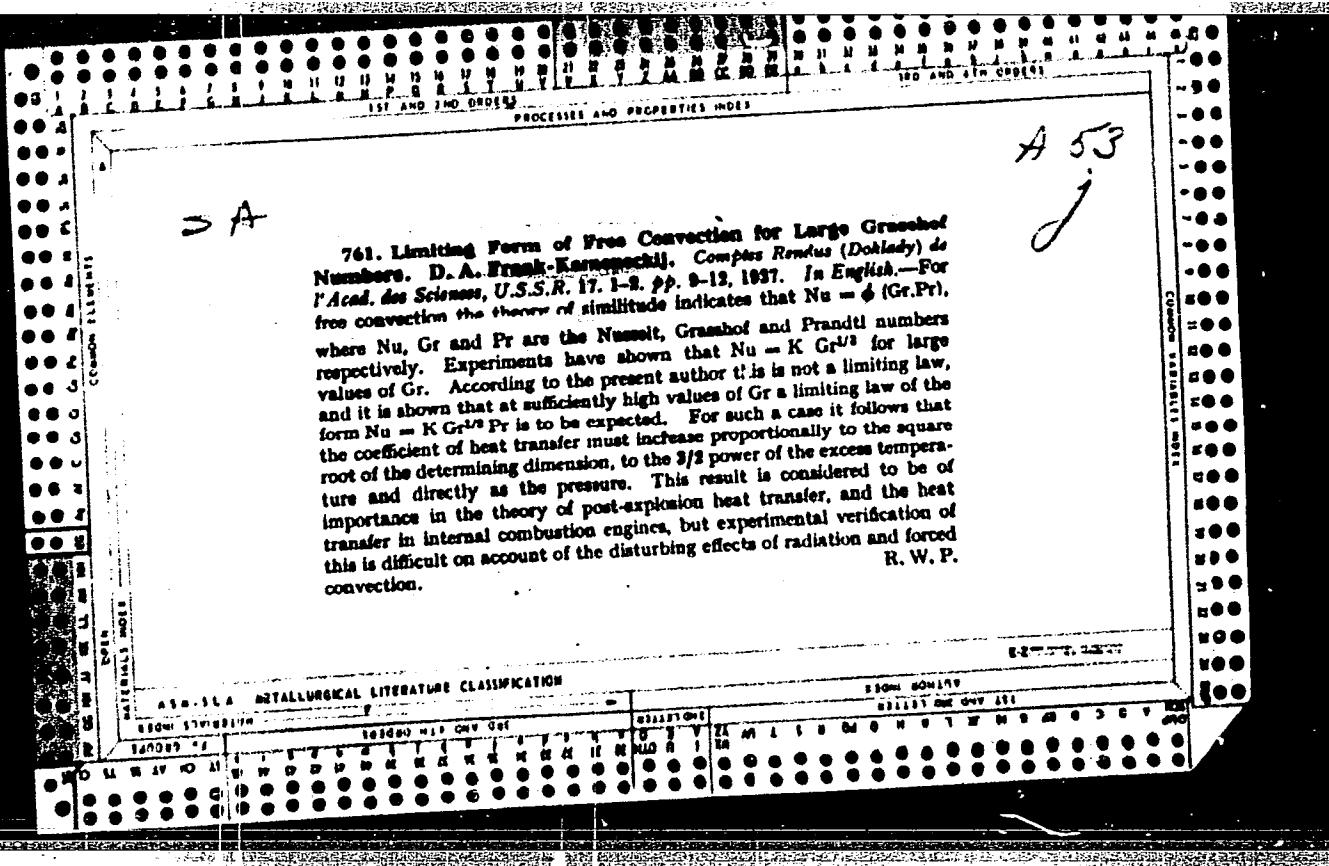
FRANK-KAMENETSKIY, D. A.

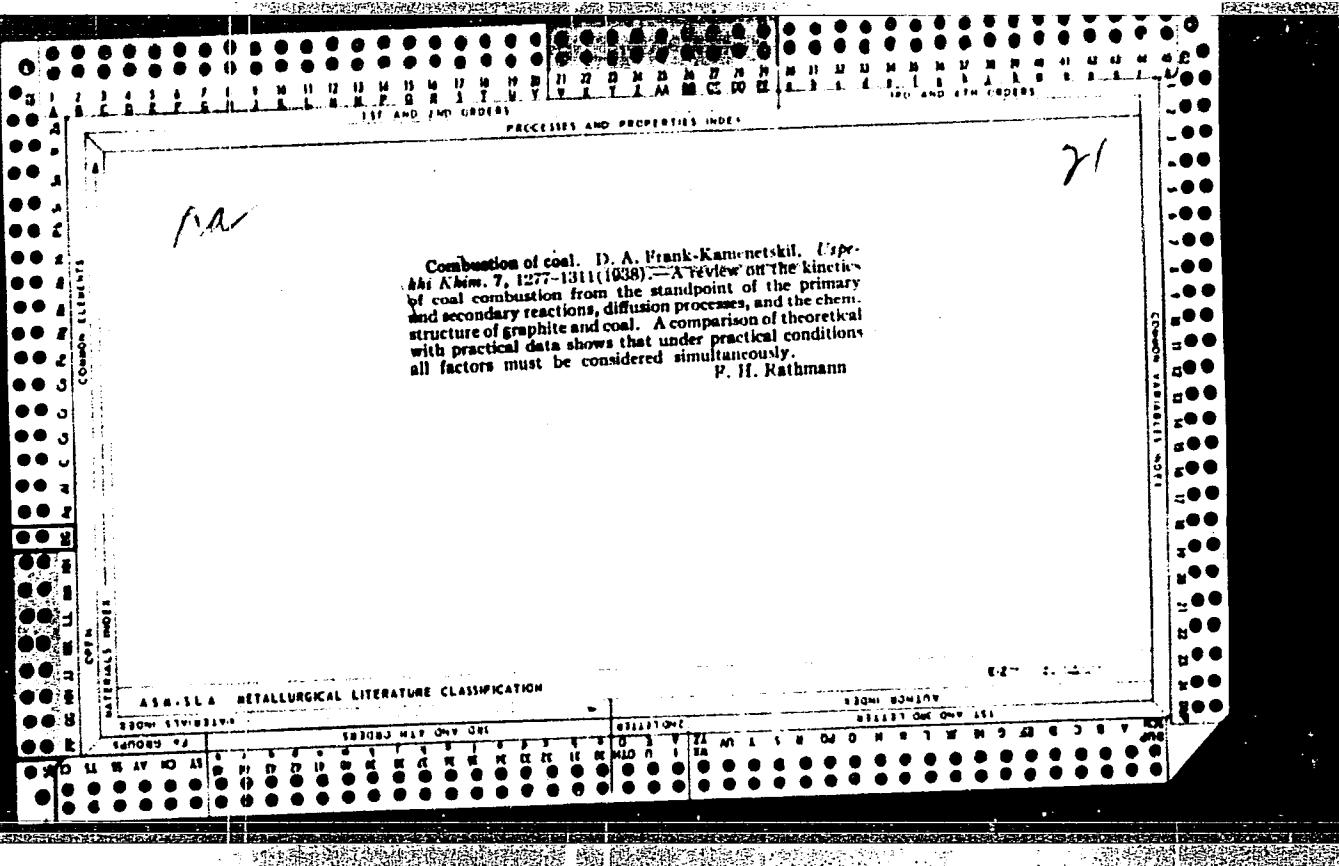
"Recovering Sulfite Concentrates," USSR Patent 31, 132, September 30, 1933

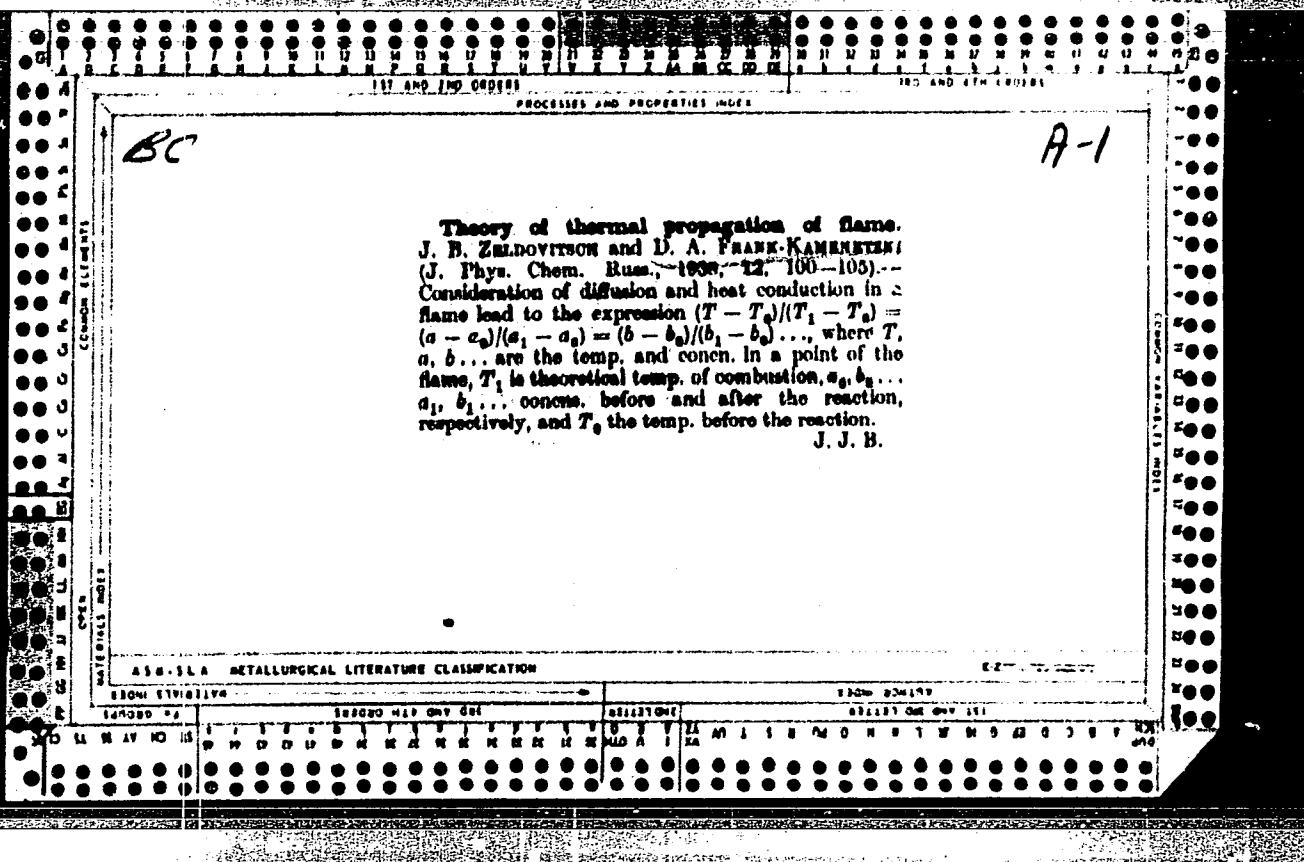
*Concentrating zinc vapors. D. A. Frank-Kamenetskii.
Russ. 31,736, Feb. 28, 1934. Zn vapors are "boned" by
passing through a tower filled with coke.*

Podlussnii Golets gold deposit (central Siberia). D. A. Frank-Kamenetskii. Sov. Zolotozem. 1935. No. 21-4741-62. Podlussnii Golets is the largest massive Au-bearing chalcocite body found in the Kominar Au mine (formerly Blagodatovskii). Results on the flotation and assay of Au from this mine are described. 8 p. M

ASB-SEA - METALLURGICAL LITERATURE CLASSIFICATION







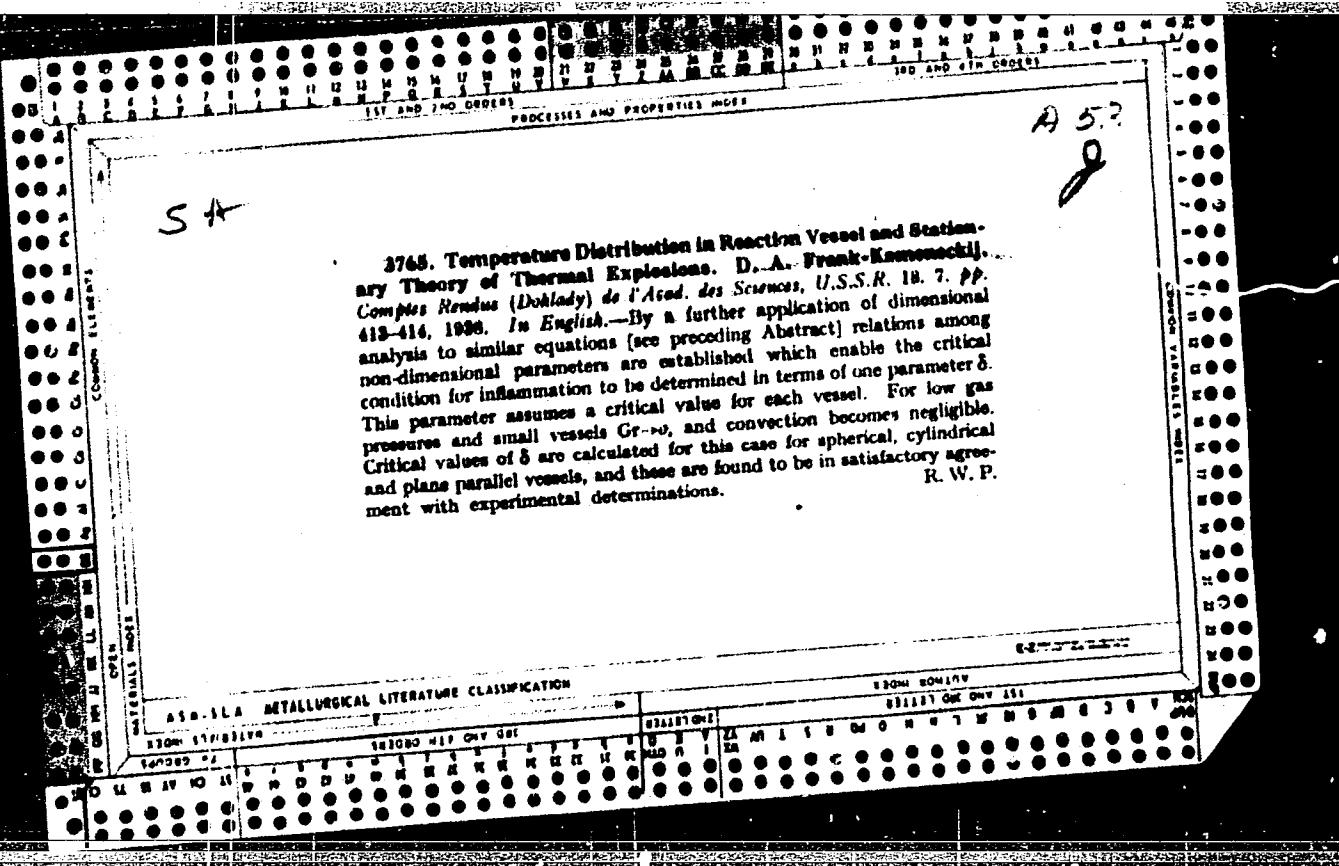
SA

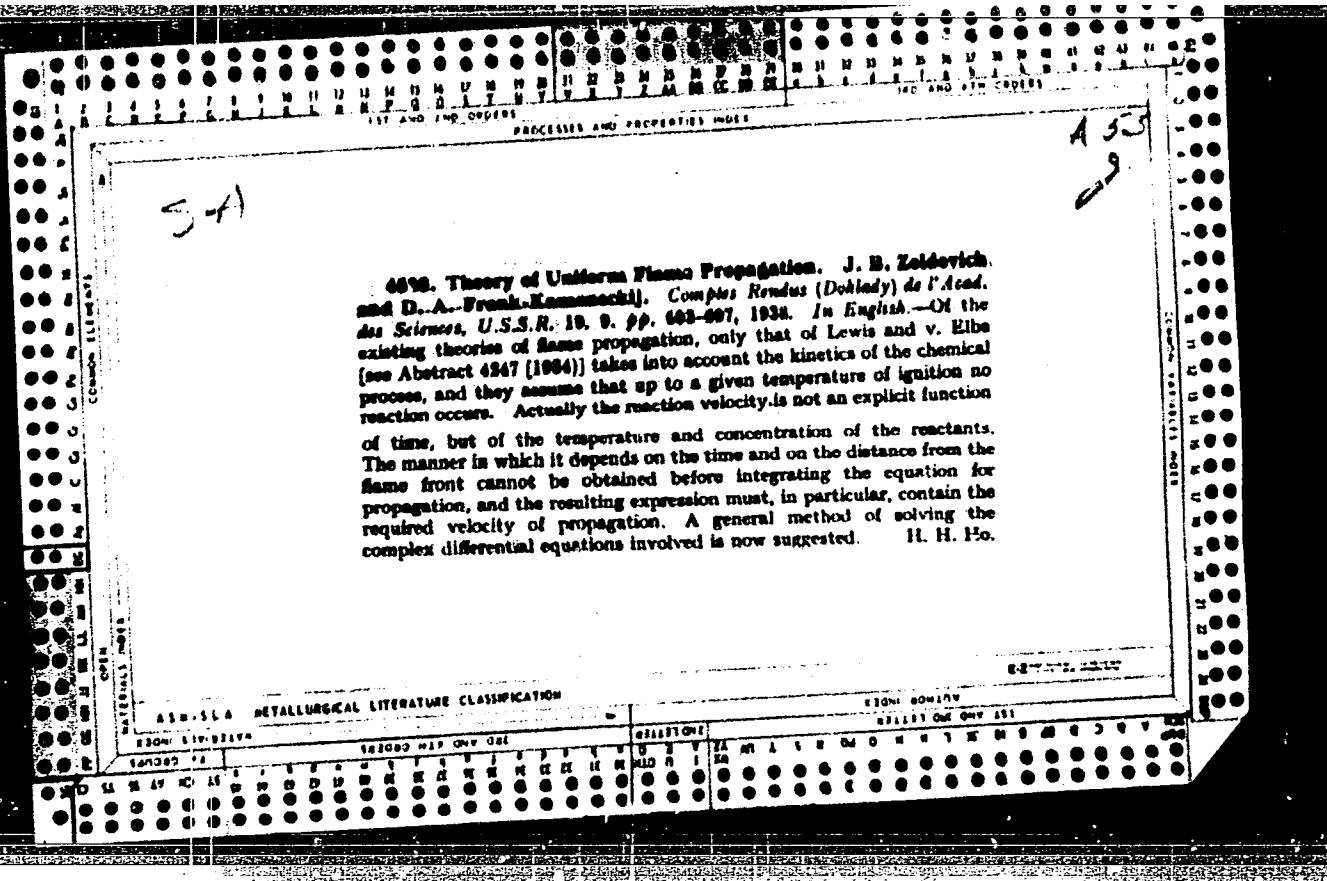
A53j

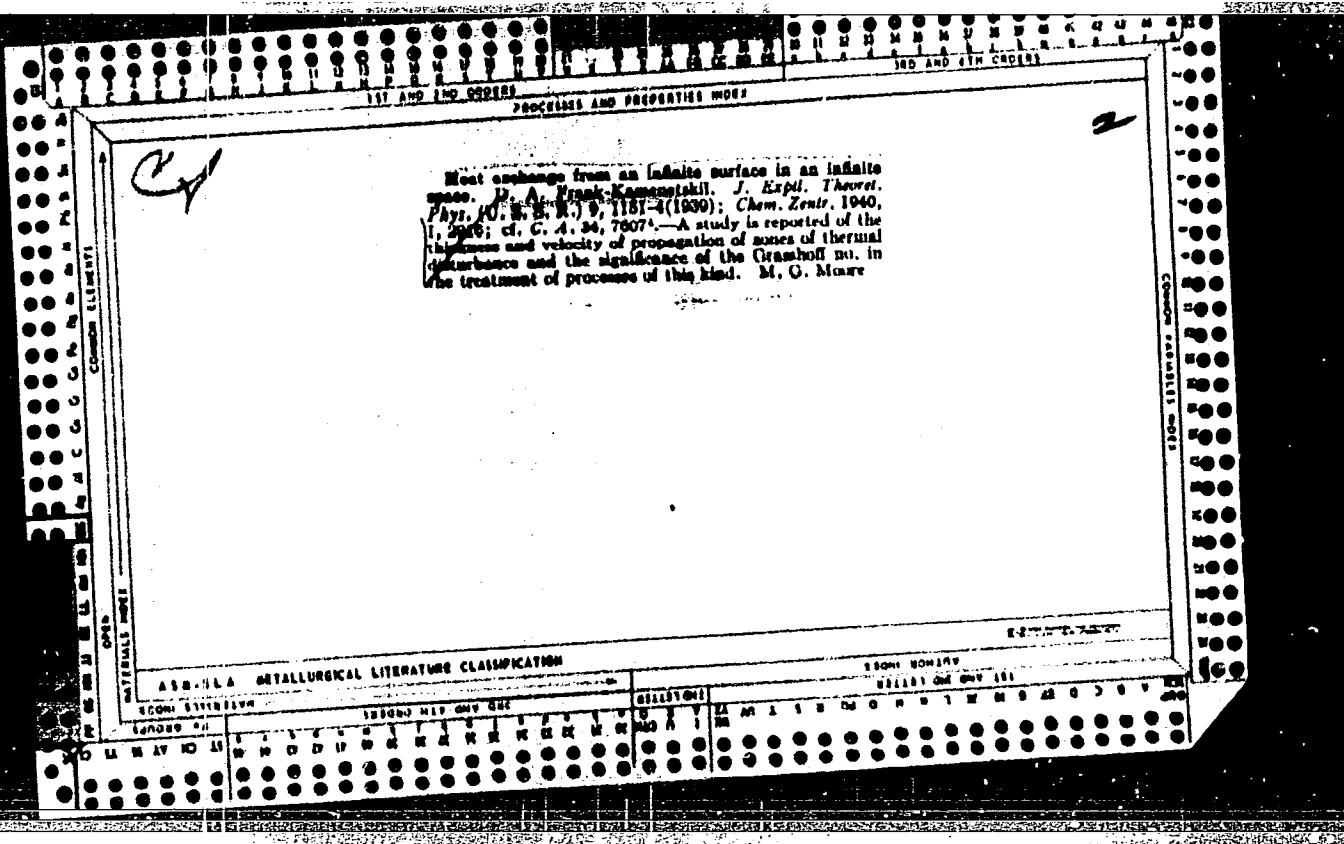
3764. Non-Stationary Free Convection. D. A. Frank-Kamenetskij. Comptes Rendus (Doklady) de l'Acad. des Sciences, U.S.S.R. 18, 7, pp. 409-413, 1938. In English.—Dimensional analysis is applied to the thermal and hydrodynamical equations which represent free convection in the initial non-stationary stage. It is shown that the temperature distribution and the coefficient of heat transfer can be expressed as functions of two non-dimensional terms l/τ_1 and l/τ_2 . The values of τ_1 and τ_2 are d^2/α and $(d^2/\beta\alpha)^{1/2}$ respectively, where d —length parameter, α —thermal diffusivity, g —gravitation acceleration, β —coefficient of expansion and θ_0 —characteristic temperature difference. Since $(\tau_1/\tau_2)^2 = GrPr^2$, it follows that the functions can be so transformed that only Gr and one of the arbitrarily chosen quantities τ_1 or τ_2 remains. The limiting case of $\tau_1 \gg \tau_2$, i.e., $Gr \gg 1$ has already been discussed by the author [see Abstract 761 (1938) and following Abstract.] R. W. P.

ASH-SLA METALLURGICAL LITERATURE CLASSIFICATION

Volume 13 Number 10, October 1958







Ignition of coal and high-speed gasification. D. A. Frank-Kamenetskii. *J. Tech. Phys.* (U. S. S. R.) 9, 1157-67 (1939).—Theoretical. Reactions between gas and solid are considered and the conditions stated for the rate of reaction to be, by the reaction const. and for it to depend on the rate of the gas flow. When the reaction is exothermic and the gas flow rapid the transition from one state to the other takes place suddenly at a definite temp. This explains the results of Grodovskii and Chukhanov (cf. *C. A.* 30, 6163'). J. J. Bikerman

31

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Calculation of thermal explosion limits. D. A. Frank-Kamenetskii, *Acta Physicochim. U. R. S. S.* 30, 305-70 (1959) (in English).—A thermal explosion theory leading to the equation $\Delta T = - (Q/\alpha) \ln - R/RT_0 \ln (R/RT_0) - T_0$ is developed. The ignition temp., explosion limits are calculated, agree with those experimentally found for acetone, benzene, by Rice (cf. *C. A.* 22, 1949); MeNO₂, by Appin; N₂O, by

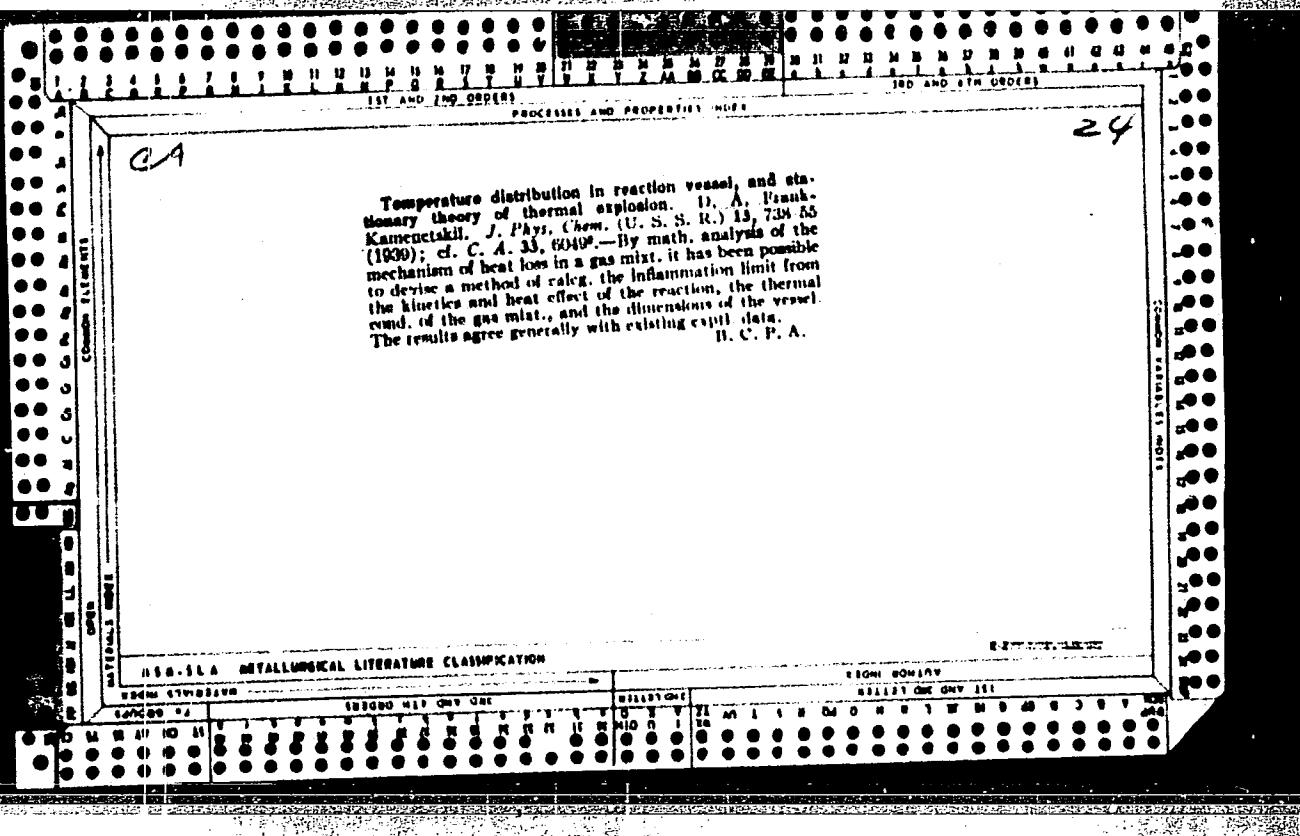
1. Shantorovich and Vakovlev (cf. C. A. 32, 8482¹); and for
1, by Y. and Shantorovich (cf. C. A. 31, 4191¹). The
explosion limit (caled. for N_2) was subsequently found ex-
perimentally. With Br azide, the calcd. values disagree
with the exptl. values of Rice and Campbell (C. A. 29,
5273¹).
p. H. Rathmann

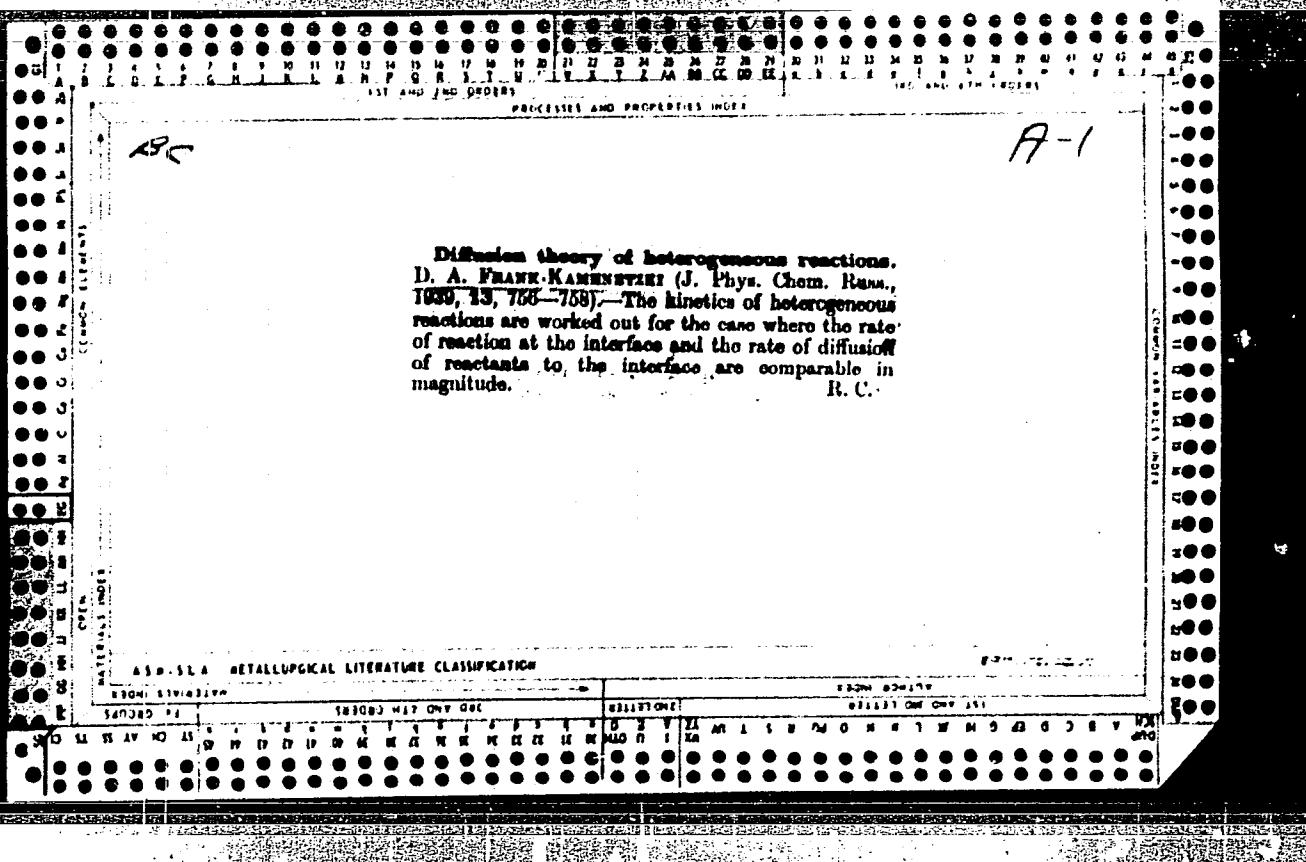
AMERICA METALLURGICAL LITERATURE CLASSIFICATION

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CIA-RDP86-00513R000413610002-4"





Carbon dioxide reduction. D. A. Frank-Kamenetskii. Compt. rend. acad. sci. U. R. S. S. 23, 937-8 (1930). - The kinetics of the reduction of CO_2 by activated ash-free sugar C were measured under static conditions by a method similar to that of Broon and Travers (C. A. 26, 3427) at 600-900° and at pressures of 50-200 mm. Hg. The course of the reaction was followed by measuring the thermal cond. of the gas mixt. With a surface-cleaned C a measurable reaction takes place at not less than 600°, and between 600° and 750° the reaction is $\text{CO}_2 + \text{C} \rightarrow \text{CO} + (\text{CO})$ (1),

where (CO) denotes a surface oxide of C which can be regarded as chemisorbed CO_2 . In this temp. range the total pressure, after an initial drop, remains approx. const. From 750° to 900° a steady increase in pressure is found which in the initial stages is not equiv. to the CO formed. No CO is formed between 400° and 600°, and the only sign of action is an initial fall in pressure owing to activated adsorption of CO_2 . The formation of an activated complex (CO_2) is probably responsible also for the initial fall in pressure between 600° and 750°. The phenomena between 750° and 900° are considered as a superposition of 1 and of (CO) desorption, $(\text{CO}) \rightarrow \text{CO}$. At room temp. only the process of a phys. CO_2 adsorption has been observed, and its velocity is immeasurably high. Two schemes of the reaction mechanism satisfactorily explain the observed phenomena: (1) the direct impact of activated CO_2 mole. on a C surface free from (CO) and (CO) , and (2) the theory that the first step of the reaction is the activated CO_2 adsorption followed by the reaction of chemisorbed (CO_2) with a surface free from (CO) .

B. C. P. A.

Physico-Chem. Lab.
Mbr., AS

A3-11A METALLURGICAL LITERATURE CLASSIFICATION

1900-19181919

1919-19381939

1939-19581959

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223

RESONANCE THEORY OF AUTO-CATALYSIS. D. A.
FRANK-KAMMERER (Compt. rend. Acad. Sci.
U.R.S.S., 1939, 25, 669-670).—A lowering of
activation energy through resonance between two
canonical structures of the transition state, arising
when reaction takes place in a collision of a molecule

of product with a mol. in the initial state, is suggested in the case of reactions of the form $A \rightarrow B_1 \rightarrow B$ where A and B are initial and final states, and B_1 is the transition state. I. J. J.

Inst. of Chem. Physics, Leningrad

ASB-LSA METALLURGICAL LITERATURE CLASSIFICATION

SCIENTIFIC

TECHNICAL

EDUCATIONAL

GENERAL

APPLIED

Periodic processes in the kinetics of oxidation reactions. D. A. Ponomarenko, *Compt. rend. acad. sci. U. R. S. S.*, 29, 671-2 (1959) (in English).—For the autocatalytic reaction proceeding with the participation of two active intermediate products X and Y given by the scheme: $A + X \rightarrow B + ZX$, $X + Y \rightarrow B + 2Y$, $A + Y \rightarrow B$ it is shown that the process proceeds in a periodic fashion, representing a kind of nonlinear vibration. The mechanism may play an important role in the oxidation of higher hydrocarbons and may explain the phenomena of two-stage ignition.

Inst. Of Chem. Physics, Leningrad

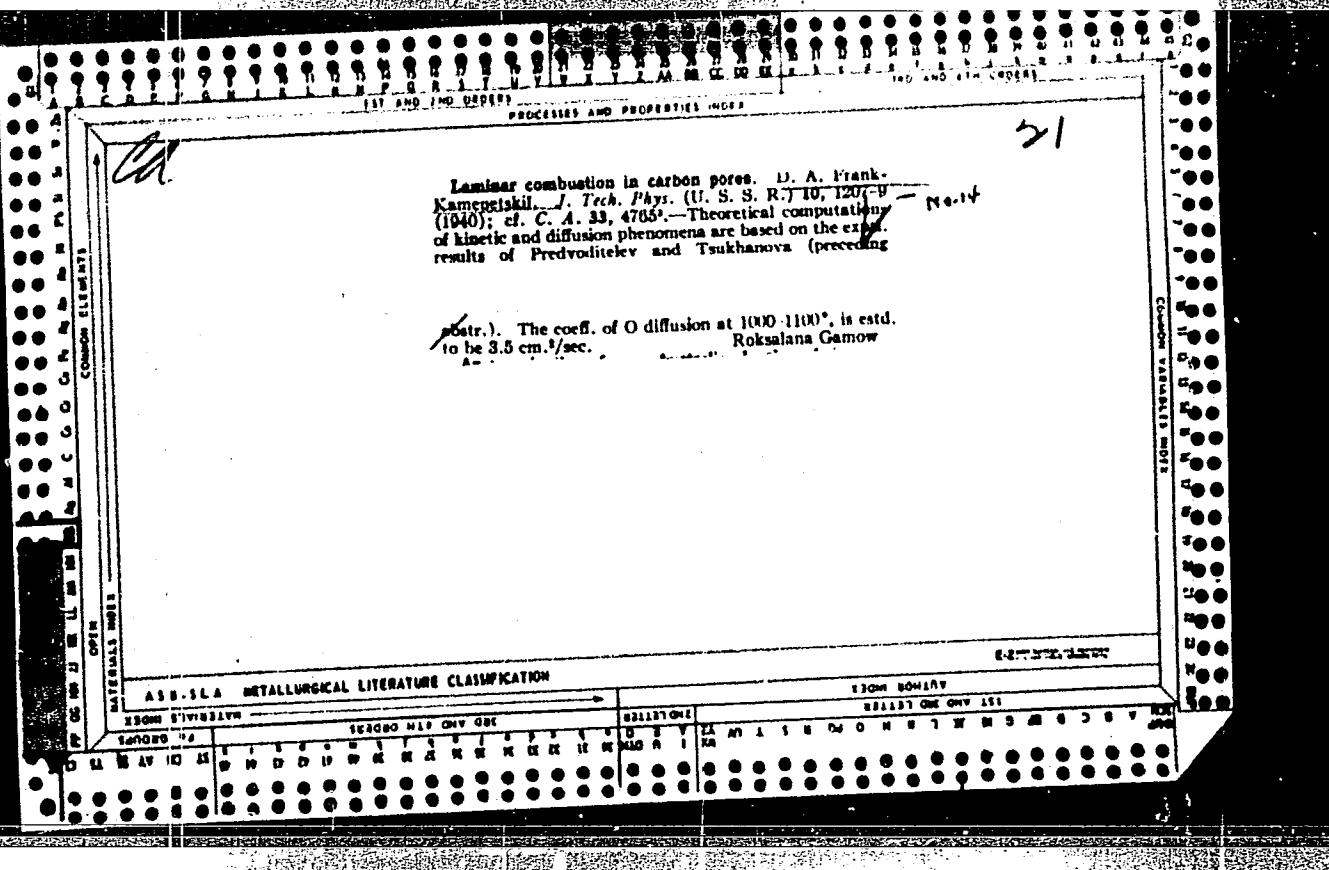
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CIA-RDP86-00513R000413610002-4"

FRANK-KAMENETSKIY, D. A.

"A Thermodynamic Analogy of the Uncertainty Principle," Zhur. Eksper. i Teoret. 10, No. 6, 1940. pp. 700-702

Inst. Chemical Physics, Leningrad.



Ca

PACCIOLI AND PROSPERINI, 1944

Diffusion and kinetics of heterogeneous reactions. D. A. Frank-Kamenetskii. *Acta Physicochim. U. R. S. S.* 12, 9-12 (1940) (in English).—Theoretical math. The case in which the rates of the kinetic reaction and the diffusion processes are nearly equal is considered. Diffusion theory of photographic development. D. A. Frank-Kamenetskii. *Ibid.* 13-24 (in English).—Theoretical. It is assumed that the rate-controlling reaction in development is the electrochem. oxidation of the developer on the silver surface. By assuming that its velocity is governed by the diffusion of the developer (Rad) and its oxidation products (Ox^+), the equation $W = A D_1 (\sigma^* - 1)/(1/Ox^*) + (D_1/b_1)(1/Rad)^{\sigma^*}$ is obtained, where $\sigma^* = (F/RT)\Delta\mu$, $\Delta\mu = (RT/F)\ln (Rad/Ox^*)/K_{Ox}$, D = coeff. of diffusion, and A is a const. depending on the developer, rate of stirring and geometrical conditions (dimensions). P. H. Rathmann

2

Physico-Chem. Lab., AS USSR, Leningrad

ASB-ISA METALLURGICAL LITERATURE CLASSIFICATION

ECONOMICS OF INDUSTRY

FROM BORIS

011121 Oct 1964 ASA

FRANK-KAMENETSKIY, D. A.

"Diffusion Theory of Photographic Development," Acta Physicochemica URSS,
Vol. 12, pp 13-24, 1940

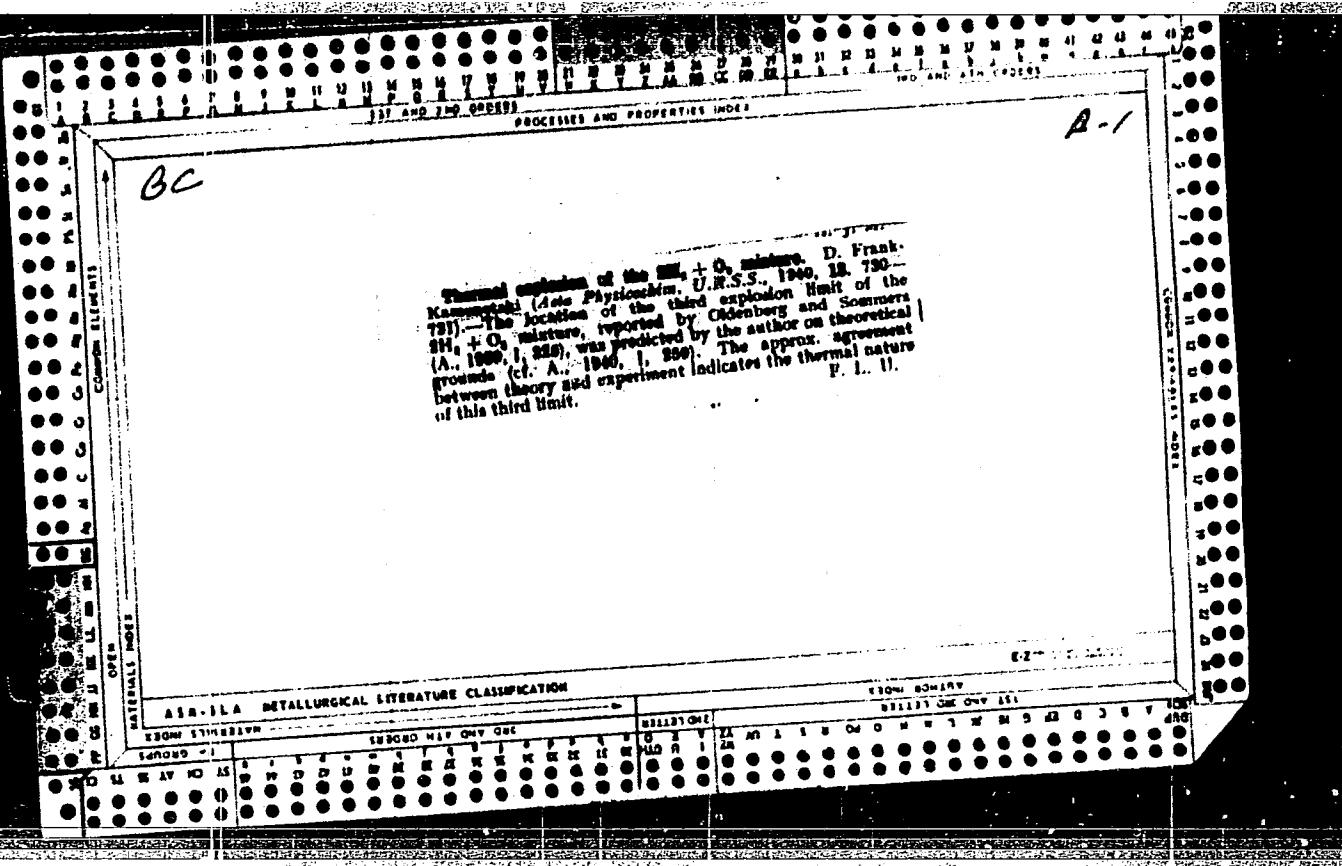
Carbon dioxide reduction. A. D. Smirchikov and D. A. Frank-Kamenetskii. *Acta Physicochim. U.R.S.S.* 12, 87p-96 (1940) (in English).—The kinetics of the reaction $\text{CO}_2 + \text{C} \rightarrow 2\text{CO}$ were investigated by a static method over a temp. range of 000-800° at pressures of 80-200 mm. Hg. According to the reaction scheme adopted, the primary step is $\text{CO}_2 + \text{C} \rightarrow \text{CO} + [\text{CO}]$ (where $[\text{CO}]$ denotes chemisorbed CO) occurring on the free C surface and requiring activation in the gas phase. The energy of activation is about 37 kg. cal., independent of surface conditions. The reaction is inhibited by the $[\text{CO}]$ accumulated on the surface. The crit. increment of the reaction $[\text{CO}] - \text{CO}$ depends on the surface conditions and on the presence of mineral admixts.; it decreases upon the addn. of Fe. At low temp., activated CO_2 adsorption inhibits the reduction of CO_2 . The stationary reaction rate of the CO_2 reduction is given by the formula:

$$W = \frac{0.6 \times 10^{-3} \text{ C} \exp \left[\left(E_2/2430 \right) - \left((2000 + E_1)/RT \right) \right]}{0.8 (\gamma) \exp \left(2000/RT \right) + 8.0 \times 10^{-3} \exp \left[\left(E_2/2430 \right) - \left(E_1/RT \right) \right]}$$

In this equation W is the reaction rate in moles per cm^2 per sec., C is the concn. of CO_2 in the gas phase in moles per cc., γ is the adsorption capacity of C in moles of $[\text{CO}]$ per cm^2 , and E_2 is the desorption energy of $[\text{CO}]$ in cal. per mole. H. C. Thomas

ASR-1A METALLURGICAL LITERATURE CLASSIFICATION

E-27-22-12002



A-1

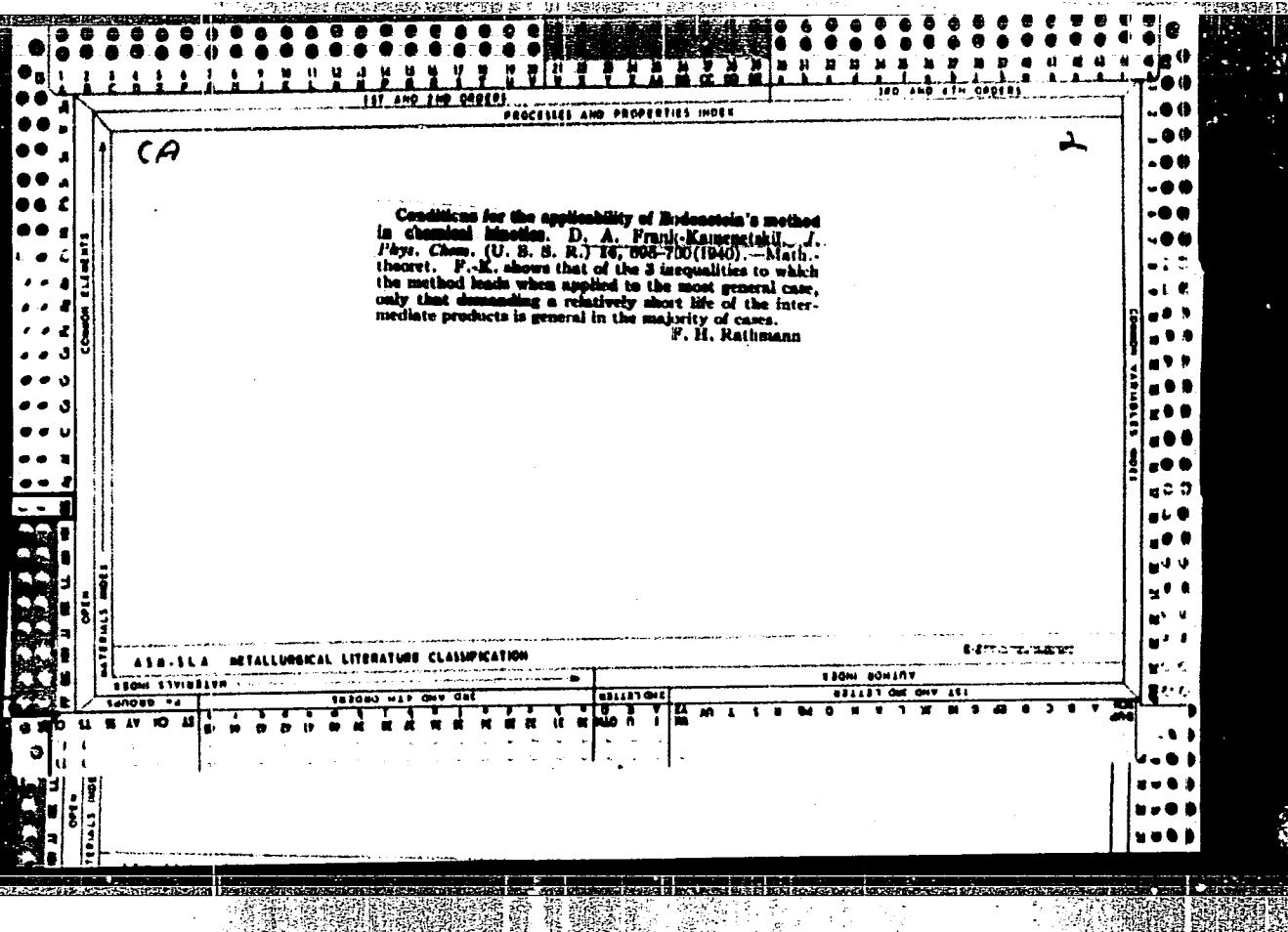
BC

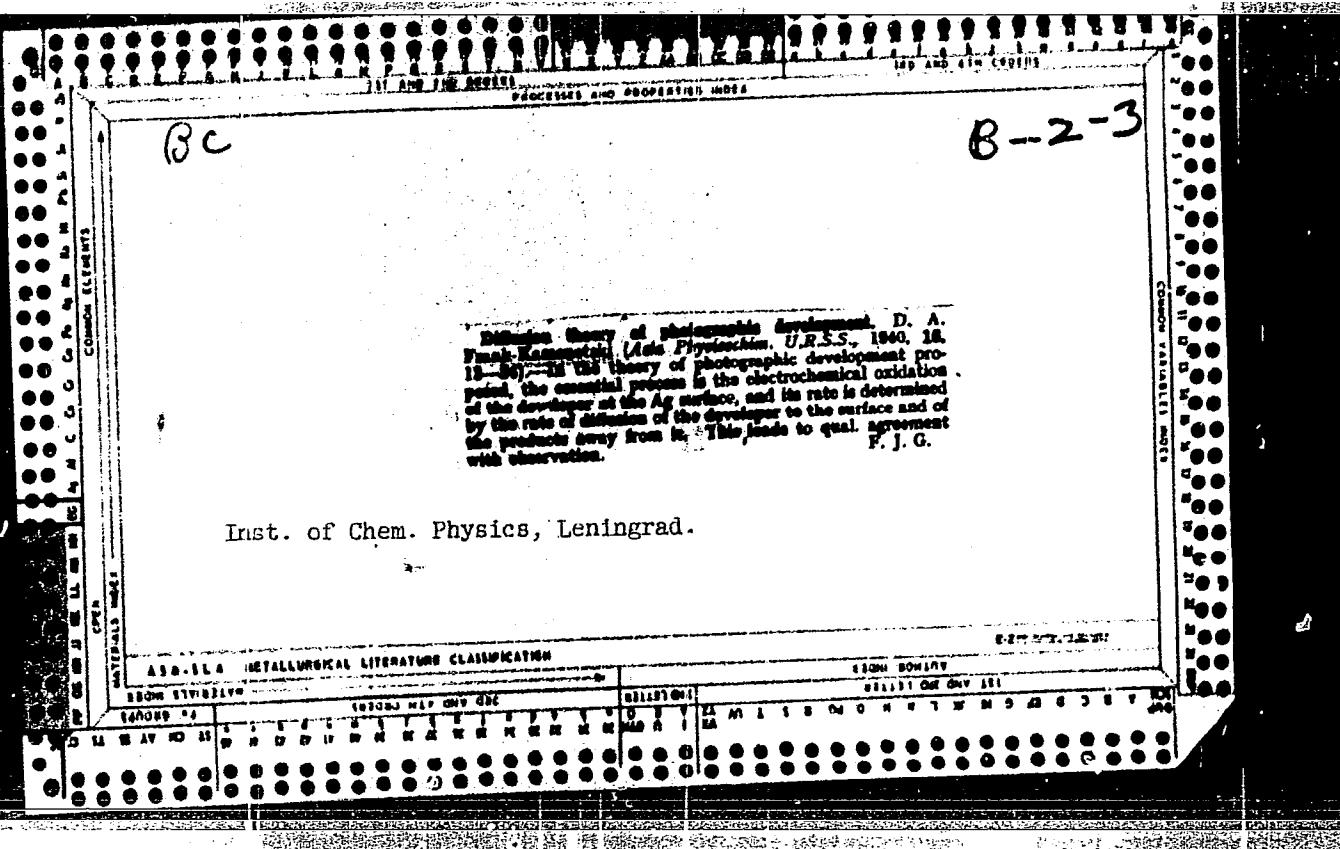
Propagation of two-stage ignition. D. A. Frank-Kamenetskii
(*J. Phys. Chem. Russ.*, 1930, 14, 30-35).—In reactions the rate
of which increases to ignition, decreases, and then rises to a
second ignition (cf. Betrov and Neumann, A., 1938, 1, 256)
can take place if $dx/dt = k_1 x - k_2 y$ and $dy/dt = k_3 y -$
 $k_4 xy$, x , y being the concns. respectively of the com-
bustible substance X , of an intermediate product X formed
from X , and of another intermediate product Y originating
from X . In combustion of hydrocarbons the product X is
probably a per-acid, and Y an aldehyde. J. J. B.

A-1

BC

Reduction of carbon dioxide by carbon. A. F. Semetschikova and D. A. Frank-Kamenetskii (*J. Phys. Chem. Russ.*, 1940, 14, 291-294).—When coal or sugar C is heated with CO_2 at 50-200 mm. Hg the gas pressure, after a small fall due to an adsorption of CO_2 , remains const. at 600° since half of the CO formed is adsorbed by C; at 770° the pressure increases slowly, and at 800° rapidly since 3 CO are adsorbed for 1 CO_2 consumed. The reaction $\text{CO}_2 + \text{C} \rightleftharpoons \text{CO} + \text{absorbed CO}$ has an activation energy of 27 kg.-cal. for sugar, C, or $\text{C} + \text{Al}_2\text{O}_3$ or $\text{C} + \text{Fe}_3\text{O}_4$. For the activation energy of the desorption of CO vala. of 23-63 kg.-cal. are obtained. J. J. B.





Ca

2

Kinetics of complex reactions. I. Homogeneous reactions. D. A. Frank-Kamenetskii. *Uspchi Akad. Nauk SSSR* 41:5(1944). Review. Formation of intermediate products, stationary and nonstationary course of reactions, autocatalysis and its mechanism, periodic reactions and the principle of detailed equl. are discussed and illustrated by various examples (combustion of CO, H₂ + halogen reactions, thermal decompn. of hydrocarbons, polymetric reaction of α,ω -disubstituted ethylenes). F. H. Rathmann

Kinetics of complex reactions. II. Heterogeneous reactions. D. A. Frank-Kamenetskii. *Uspchi Akad. Nauk SSSR* 41:6(1944). Theoretical and review. The influence of adsorption on nonhomogeneous reactions and the role of various stages of adsorption in heterogeneous catalysis are discussed. Ethylene hydrogenation and the CO₂ + C = 2 CO reaction are considered as examples of heterogeneous complex reactions. 34 refs. F. H. Rathmann

Ignition and extinction of solid surfaces. D. A. Frank-Kamenetski
(*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **30**, 734-737).—An
equation for the steady surface temp. during surface reaction is
derived, and the conditions of the surroundings for this temp. to be
unique are determined. The implications of this with respect to
the transition of a reaction from small to large temp. intervals above
the surroundings are considered.
H. V. S.-R.

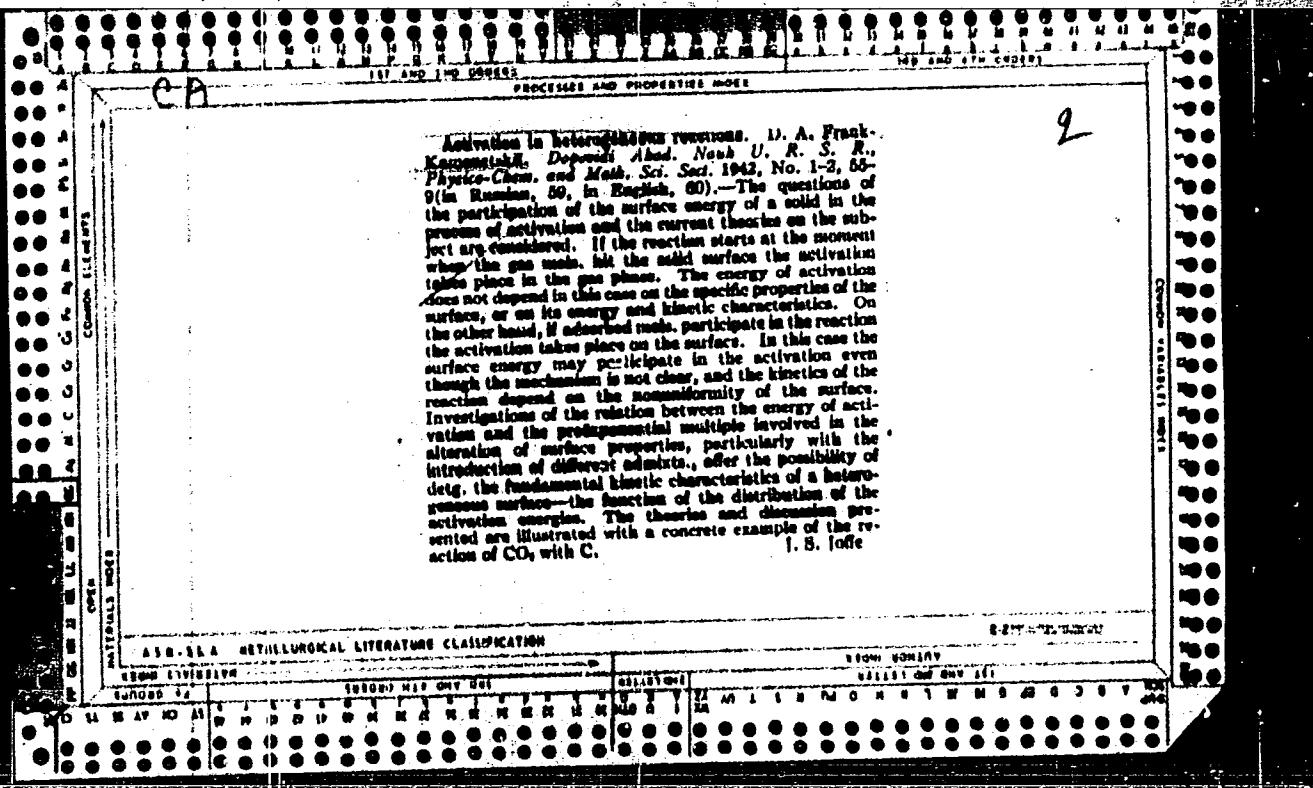
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The thermal regime of heterogeneous exothermal reactions. D. A. *Frank-Kamenetskii*, *Doklady Akad. Nauk U. R. S. S. Fiziko-Chem. i Mat. Nauk*, 1942, No. 1-3, 47-61 (in Russian, 82, in English, 82-3).—Two thermal regimes of a reacting surface are possible in the course of strongly exothermal heterogeneous reactions of a high temp. coeff. The upper regime corresponds to extended high heating and to a diffusion region, and the lower regime to low heating and to the kinetic region. The transition between these 2 regimes takes place suddenly at the crit. conditions of ignition and heat extinction. Heating of the surface at the upper temp. regime is detd. by the conditions of diffusion and heat transfer and does not depend on the kinetics of the reaction, as may be demonstrated experimentally. In the catalytic oxidation of N_2 , thermocatalysis plays an important part. On the other hand, the crit. conditions of ignition and extinction depend on the kinetics of the reaction. The energy of activation can be critd. easily from the magnitude of the interval between these 2 points—ignition and extinction. Exptl. data are presented on the catalytic oxidation of H_2 and NH_3 on Pt. These confirm the considerations presented and point to a possible application in tech. problems.

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J. S. Wiss.

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B1.16.

No. 4

Periodic reactions and the mechanism of hydrocarbon oxidation.
J. G. Gervart and D. A. Frank-Kamenetskii (*Bull. Acad. Sci. U.R.S.S., Cl. Sci. Chim.*, 1947, 310-320).—The passage of a mixture of higher hydrocarbons and air (or O_2) through a turbulent reaction chamber causes, within a suitable temp. range, regular pulsations of cold flame. The frequency of these is almost independent of the type of fuel or of its concn. but increases sharply with a rise in temp. or of $[O_2]$. Experiments were carried out with straight-run, polymer, and by-product (from synthetic rubber manufacture) gasoline. The optimum temp. for the occurrence of pulsations was 360° , with a range of $301-445^\circ$, this being widest for fuels of high olefine content. The duration of the pulsations is 2.6-3.0 sec., being the greater in the larger of the two reaction vessels used. The excess air coeff. was 0.08-0.23. The data presented, particularly the independence of the pulsation frequency of the rate of fuel feed, confirm the kinetic nature of the phenomenon.
V. B.

Institute of Chemical Physics

FRANK-KAMENETSKIY, D. A.

"Theory of Vapor Condensation in the Presence of Noncondensing Gases,"
Zhur. Tekh. Fiz., 12, No. 7, 1942, pp. 327-366.

Inst. Chem. Phys., AS USSR

Calculation of isomerization equilibrium of ethene and methylacetylene. D. A. Frank-Kamenetskii and V. O. Markovitch (J. Grn. Chem. Russ., 1943, 19, 616-630).—Quant. calculation of isomerization equilibrium with hydrocarbons, normally very difficult on account of large probable errors in the initial data, is rendered possible for C_2H_4 (I) and CH_3C_2H (II) by the very accurate experimental data of Kucherov (A., 1934, 281; 1939, I, 473) on the heats of hydrogenation of the isomers, by the known Ramsay and infra-red spectra which give vibration frequencies of the mol. (Lianet and Avery, A., 1940, I, 9; Crawford, ibid., 1940), by data of mol. structures and intern. distances (e.g., Pauling, A., 1937, I, 448), giving mass moments of inertia, and by the fact that the absence of internal rotation simplifies calculations. It is shown that the state sum method and the standard entropy method yield the same results for equilibrium const. and concns. at corresponding temp. The const. (state sum method) is 16.71 (834° K.), 9.04 (473° K.), 5.52 (673° K.), 4.74 (773° K.), or 4.31 (873° K.) and the % of (I) in the equilibrium mixture is 9.86, 9.06, 15.26, 17.42, or 19.30 respectively. The heat effect of isomerization has min. at ~473° K. The calc. concns. of (II) are > the only analytical vals. recorded (Slobodkin, A., 1937, II, 174) but in that case equilibrium was either not attained or it was complicated by the presence of extraneous gases produced possibly by polymerisation and decomp. of the polymers. In the standard entropy method, the total S ($S_{\text{trans}} + S_{\text{rot}}$) is consistently ~2.10 g.-cal. per degree per mol. > Lianet and Avery's results (ibid.); as the results for S_{rot} agree exactly it is supposed that the earlier workers took 12 and not 4 as the symmetry no. for (II), which would make their results low by $R \log_2 3$ (or 2.19). G. S. S.

C. S. S.

APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000413610002-4"

FRANK-KAMENETSKIY, D. N.

"Mathematical Theory of Thermal Explosions," Acta Physicochemica URSS, Vol. 16,
pp 357-361, 1942

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Incorporation equilibrium, ethene or methylacetylene. D. A. Frank (Kamenskhi) and V. G. Markovitch (Acta Physicochim. U.R.S.S., 1948, 19, 804-812).—The val. of the equilibrium const. calc. from spectroscopic and heat of hydrogenation data, are 15.8,

9.9, 6.5, 4.7, and 4.2 at 22°, 200°, 400°, 600°, and 800° respectively. With rise of temp. the proportion of $C(CH_3)_2$ in the equilibrium mixture rises from 6.0% to 19.2%. Revised vala. for the entropy of $C(CH_3)_2$, at these temp., are 60.92, 65.87, 73.44, 78.78, and 79.91 g.-cal. per degree per mol. respectively. C. K. H.

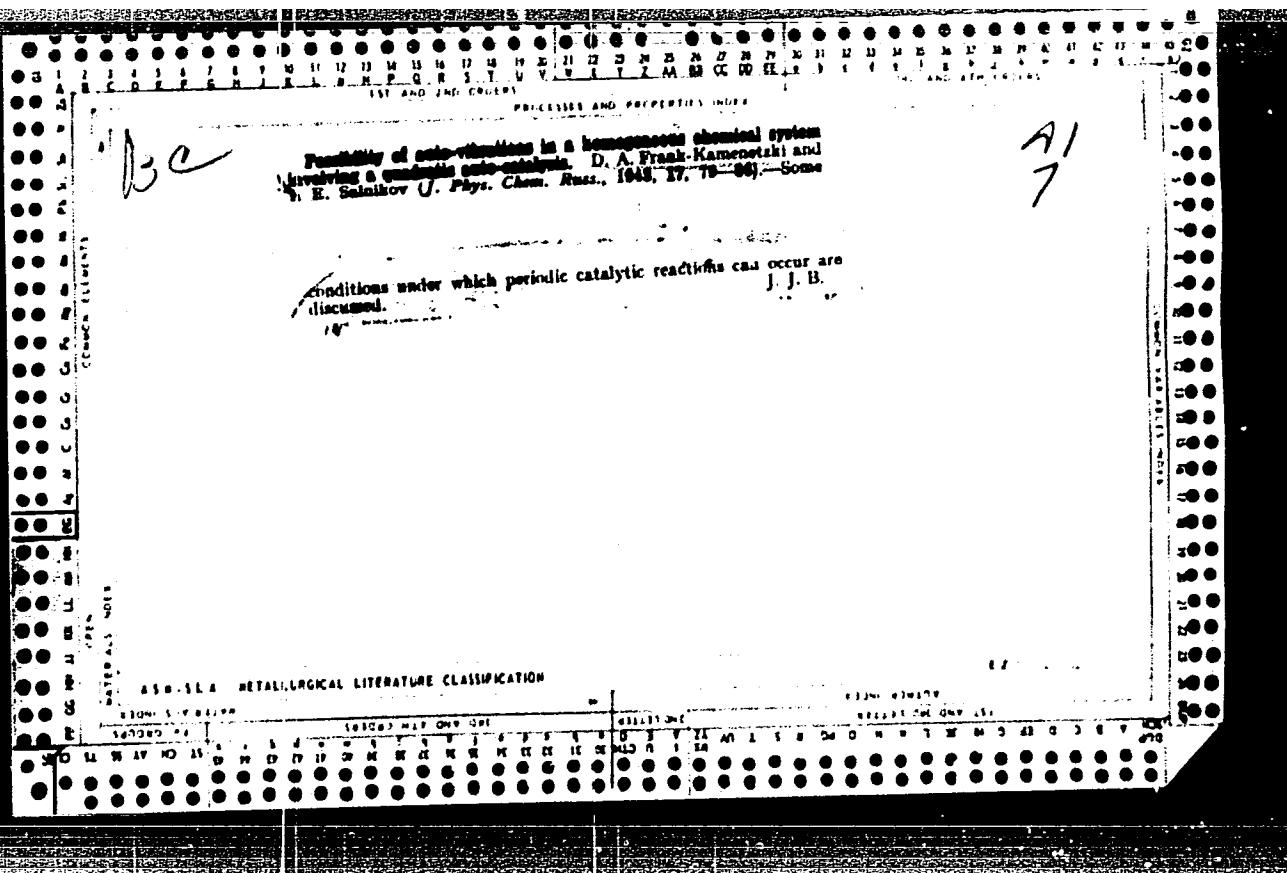
B-1-3

Chemistry of polymerization, *Part I*. D. A. Frank-Kamenetskii (Comp. rend. Acad. Sci. U.R.S.S., 1946, 50, 128-130).—Thermal polymerization of C_2H_4 gives primarily the cyclic dimeride (I), probably $\text{C}_4\text{H}_6\text{O}_2$ or $\text{C}_4\text{H}_6\text{O}_2\text{C}_2\text{H}_4$, which is relatively stable at high temp.; when heated to 200° it undergoes immediate polymerization with formation of (II). No derivative of (I) was isolated. When the polymerization gases are passed through HNO_3 (*d* 1.4), a red product called "dinitro- C_2H_4 " (III), containing 50% of $\text{C}_2\text{H}_4\text{O}_2$, is obtained; this can be converted into a colorless, soluble in CHCl_3 and C_6H_6 compound (IV), which on treatment with NaOCl gives a yellow product, $\text{C}_2\text{H}_4\text{O}_2\text{Cl}_2$ (V), and Cl_2 (VI). Compound (V) has a definite mol. wt. and no polymeric character, and derived tar is not formed. The tar is formed when C_2H_4 is polymerized at 200° in the presence of HNO_3 . Such tar cannot be obtained by pyrolysis of the dinitroheptane, but a (III) compound could be prepared by the same method. Compound (V) (*d* 1.14) acts on the products of low-temp. ($200-250^\circ$) polymerization.

Inst. Chem. Physics; AS

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AS USSR

41-6. *kinetics*
thermodynamics

Kinetics and mechanism of photographic development. D. A. Frank-Kamenetskij [Acta Physicochim. U.R.S.S., 1943, 19, 91-92].— The exponential increase of velocity of linear growth of an individual Ag nucleus with time (Rabinovitach, A., 1943, 1, 93) can be explained on the assumption that rate of development is determined by the electrochemical oxidation of the developer proceeding on the whole surface of the Ag nucleus, the deposition of Ag taking place, however, only on its perimeter. The theory of Anastasovitach (ibid, 95) is discussed.

AS USSR, Inst. of Chem-Phy.

AI-8-sections

By abo

Thermal reactions of acetylene. I. Kinetics and mechanism of thermal polymerization of acetylene and its reaction with nitric oxide. D. A. Frank-Kamenetskii (*Acta Physicochim. U.R.S.S.*, 1943, 19, 148-158).—The thermal polymerization of C_2H_2 at 400-700° and 50-760 mm. occurs in three stages: (i) an induction period without change of pressure, (ii) a homogeneous bimol. dimerization, (iii) a heterogeneous reaction with formation of high polymers. H_2 and C_2NO prolong (i), and polymerization is delayed until the NO is consumed. The temp.-dependence of (i) and (ii) corresponds with the same activation energy. The kinetics agree with a scheme involving primary combination of $2C_2H_2$ to give an unstable C_4H_4 which can decompose into $2C_2H_2$ or two radicals, the latter at a slow rate. L. J. J.

Inst. of Chem-Phy.

Thermal reactions of C_2H_2 . I. Kinetics and the mechanism of the thermal polymerization of C_2H_2 and of its reaction with NO. D. A. Frank-Kamenetskii, *J. Phys. Chem. (U.S.S.R.)* 18, 339-34 (1944).¹⁰ Bapit data show that at pressures of 50-100 mm, and temps. of 400-700°, the course and rate of the reaction are essentially the same in glass, quartz, and "durabak" vessels. A little as 1% of NO completely inhibits the reaction, and the reaction does not again proceed until the NO has been consumed by reaction with C_2H_2 to form an addition compd. This period of inhibition is directly proportional to the partial pressure of NO added, and inversely proportional to the square of the total pressure. F. H. Rathmann

*By. Abs.**II-8. Reactions*

Ignition of carbon and kinetics of its reaction with oxygen.
A. Klibanova and D. Frank-Kamenetzki (Acta Physicochim. U.R.S.S., 1943, 18, 387-405). - The kinetics of the reaction between C and O₂ at ordinary pressure and at high temp. have been measured by a method based on the determination of the temp. which a C filament must attain before it ignites in a stream of air or other O₂-containing gas. The abs. reaction velocity at ~ 1200°K. is ~ 10⁻⁴ mol. per c.c. per sec., a val. of the same order as is obtained by other methods. The present data show a temp.-dependence which suggests an activation energy > energies previously reported. The present val. is 75-135 kg.-cal. per mol., corresponding with a reaction order 0.4-0.8, and definitely < 1. C.R.H.

AS USSR, Inst. of Chem-Phy